Radiation Physics and Chemistry 2003 vol.68 N3-4, pages 609-612

Studies of positron states and annihilation characteristics at the reconstructed (100) surface of GaAs

Fazleev N., Fry J., Weiss A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The high-resolution positron-annihilation-induced Auger spectrum from GaAs(100) displays six As and three Ga Auger peaks below 110eV corresponding to M4,5VV, M2M4V, M2,3M 45M45 Auger transitions for As and M2,3M 4,5M4,5 Auger transition for Ga. PAES data is analyzed by performing quantum mechanical calculations of positron surface states and annihilation characteristics for As- and Ga-rich reconstructed (100) surfaces of GaAs. It is shown that by comparing theoretical positron annihilation probabilities for relevant core electrons with experimental ones estimated from the measured Auger peak intensities, it is possible to identify the chemical composition of the topmost layers of the GaAs(100) surface.

http://dx.doi.org/10.1016/S0969-806X(03)00241-X

Keywords

Annihilation, Auger, Binding, GaAs, Positron, Reconstruction, Surface, Work function